

Emerging Engineers: Designing an event series for engineering alumni to share advice with current students

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Abstract

In this paper, engineering librarians discuss the creation and implementation of the Emerging Engineers speaker and workshop series, which they started in Fall 2023 and remains ongoing. This program invites local engineering alumni back to campus to discuss their career journeys, their transition from student to professional life, and lessons they learned along the way. Speakers are encouraged to share frankly about their experiences, so students can see how their future paths are shaped by the choices, challenges, and adaptations they make throughout their academic careers. The speaker sessions are complemented by workshops that provide students with opportunities to engage in hands-on group projects in a relaxed setting. These projects are designed to be social, typically involving constructing models or kits, so attendees have a chance to connect with their peers while working on a shared objective.

The goals of these events are to equip students with valuable insights for their transition into the engineering field by offering firsthand perspectives from recent alumni, and to foster a sense of community and belonging among a population that has faced mental health challenges in recent years. The authors discuss how they secured funding, identified potential speakers, and collaborated with faculty & campus offices to make the series successful and consistently well-attended, as well as specific strategies for marketing the events, garnering student feedback, and lessons learned throughout the process. This paper explores why it's impactful for students to hear from alumni (particularly alumni from groups that are underrepresented in STEM), the value of creating space that allows for informal connection, and provides readers with tips for hosting similar events within their own libraries across a range of budgets.

Introduction

“How many people can this room hold?” “Man, this is packed!”, “I think there’s some room to stand in the back?” Students attending the October 2024 Emerging Engineers event jockeyed for space, hands full of snacks and drinks, to listen to structural engineering alumnus Dr. Nehemiah Mabry speak about his experience as a student at North Carolina (NC) State University, answer their questions, and provide guidance for making the transition from student to career professional. This event was the culmination of an intentional effort to support engineering students beyond the classroom, which began more than a year earlier.

In 2023, the Student Success Librarian at NC State reached out to the Libraries’ Engineering Team to co-develop a new event series that brought recent College of Engineering alumni, now practicing engineers, back to campus to share experiences, recommendations, and advice with

current students. This idea came from the confluence of different factors: an expansion of NC State's engineering program, a new focus on campuswide wellness in the wake of the COVID-19 pandemic and a series of student mental health crises, and a drive to help engineering students prepare for the world of work outside the classroom. Our library is a popular and active campus institution that hosts a lot of community activities and outreach events, and we thought this would be a great opportunity to design a recurring event series focused on our engineering students.

Background

NC State University is a public land-grant research institution with over 28,000 undergraduates and has undergone a recent expansion of the engineering program, projecting a 4,000+ undergraduate student increase between 2021-2026 [1]. At the beginning of this expansion, our campus was recovering from the effects of the COVID-19 pandemic, and the chancellor led an increased focus on student wellness, encouraging campus units to host events and activities that put our students' well-being first and foremost. Later in this expansion, our campus began its 2024-2029 Packways: Learning by Doing Quality Enhancement Plan (QEP), which puts an increased focus on high impact experiences [2]. To do our part in supporting our students during this time, we wanted to design an event series that would encourage students to socialize and work on projects together, while preparing them for those high impact learning opportunities, like internships and field experiences, and getting them excited about future career options.

Our goals were threefold, to give current engineering students:

- The chance to see the diverse array of career opportunities that await them as new/recent graduates
- The opportunity to hear frankly from recent graduates about the campus resources that were helpful for them, the challenges they faced, and how they made difficult decisions about their futures
- A space to make connections and build community with each other

Literature Review

As we met and brainstormed, we researched the types of events that might work best to achieve these goals. We learned that engineering employers report an increase in students being unprepared for employment after graduation [3], [4]. Specifically, they seek graduates who are skilled in communicating, problem-solving, and self-management, but new graduates are often lacking in these skills [3]. Our program helps prepare students for this through our hands-on workshops, which often involve working on a project or task as a team, in a low-pressure environment where they aren't being graded or assessed. Forming a professional identity is another essential part of students preparing for their careers after graduation, and having

opportunities for occupational socialization while still in school helps form this identity [5]. Our speaker events give students the chance to not just hear from, but interact with, professionals in their fields of interest, learning about current issues and challenges, and developing a sense for where they fit into that field overall.

We also know how important it is for students to see people who look like them succeeding in the careers that they're interested in [6], and, as practitioners of Gay's concept of culturally responsive teaching [7], made it a priority to choose speakers with a wide variety of backgrounds and experiences. It was important to us to choose speakers representing the full spectrum of academic departments in our College of Engineering as well, to show the breadth of opportunities awaiting students, no matter which program they graduated from.

With the engineering program expanding, and class sizes growing across all departments, we wanted to learn more about how larger class sizes affect student engagement. We discovered from Beattie and Thiele that within larger classes students report being more likely to feel isolated, feel a lower sense of belonging, and interact with their professors less, and that these negative outcomes are often magnified for marginalized student groups [8]. From Pedler, Willis, and Nieuwoudt, we know that helping foster a better sense of belonging on campus increases student retention rates [9], and increasing student retention is part of NC State's strategic plan.

Lastly, and more generally, we're always on the lookout for new ways to reach out to our engineering students. We were inspired by Kern et al.'s Graduate Mixer events, which provided attendees with food, socialization time, and the chance to jump between activities or stations at their own pace to learn more about the library [10]. This informed our bridge building workshop, which gave attendees the option to either construct a bridge from scratch using craft materials, or to build one using a kit. All of our workshops are structured similarly; we've found that hosting self-paced, low-pressure sessions motivates students to talk (and eat) together, and it has become a bedrock element of the program.

With all this research in mind, we set out to create an event series that would encourage students to come together, socialize, ask questions and think critically about their futures with their peers.

Project Approach

In 2023, we launched the Emerging Engineers program. The program consists of two events per semester: a speaker event featuring a recent alumnus from the College of Engineering, and a community-building workshop event.

Speaker events take place in our Teaching & Visualization Lab at NC State University Libraries, where the small space and expansive widescreen helps immerse attendees in the presentation.

These events are one hour long, take place in the early evenings, and we provide food and drinks for the attendees. Speakers are invited to present for 45 minutes, in the form of either a solo presentation, or an interview-style conversation with one of our team members. So far all the speakers have elected to give solo presentations. The last 15 minutes of the event are dedicated to answering questions from the attendees.



Fig. 1. Dr. Nehemiah Mabry speaking with an audience of students in the Teaching & Visualization Lab at the Fall 2024 Emerging Engineers speaker event.



Fig. 2. Meredith Biechele speaking with an audience of students in the Teaching & Visualization Lab at the Spring 2024 Emerging Engineers speaker event.

Our community-building workshops are held in a room at NC State University Libraries, colloquially referred to as “The Fishbowl”. The centrally-located, wide, glass-walled room is perfect for our purpose of inviting students in to collaborate on small projects or activities, to get to know one another. These activities typically involve building or constructing something together. We host these workshops in the mid-afternoon, and provide food and drinks for the attendees, often playing lo-fi music in the background to foster a relaxed and open atmosphere to socialize, connect, and build together.



Fig. 3. Students working on collaborative 3D puzzle model kits at the Spring 2024 Emerging Engineers workshop.



Fig. 4. Two students proudly showing off their completed moving airplane tower model kit at the Spring 2024 Emerging Engineers workshop.

Once we settled on these event ideas, we began seeking out funding. We applied for (and received) a “Good Ideas Grant”, an internal NC State University Libraries grant, which exists to “provide seed funding for creative experimentation and new or different approaches to services, collections, use of technology, or other challenges” [11]. We received \$5,600 to use over two years, to pay for speaker honorariums, workshop materials, and refreshments for each event (see Table I for details). With money in hand and outline in mind, we dove deeper into our planning.

Table I
Good Ideas Grant Budget

Reason	Amount	Total
\$500 (Speaker Honorarium)	4 (1 per semester over the next 2 years)	\$2000
\$500 (Workshop Costs for: Kits, glue, other materials)	4 (1 per semester over the next 2 years)	\$2000
\$200 Refreshments (per event)	8	\$1600
	Total Budget for Grant	\$5600

Planning and Outreach

The planning process for the Emerging Engineers series involves recruiting recent COE alumni speakers, providing accessible spaces and refreshments for events, designing hands-on workshops, and promoting the events to the campus community.

To identify alumni speakers, the Emerging Engineers team reached out to contacts across campus to introduce the program and request recommendations for recent graduates who may be strong candidates. The team met with faculty, administrative staff, and the career counselor for the College of Engineering to begin compiling these suggestions into a working roster of potential speakers. We met with a variety of campus groups including the Women in Science & Engineering living and learning village, Engineering Advocates for Student Communities through Engagement, Networking, and Development (ASCEND), Society of Hispanic Professional Engineers, and National Society of Black Engineers to seek their input and initial feedback on the program. Once alumni have been identified, they are contacted individually to extend invitations and garner their interest in participating in the speaker series. The team then meets with confirmed speakers to discuss their ideas for presentations, highlighting their own experiences as an engineering student that might most resonate with student audiences.

To maximize accessibility, the series events have been hosted across the two main libraries at NC State, which are located on separate campuses. This approach ensures that students from across

campus representing different academic and geographic communities can participate without barriers. Before each event, students are invited to come early to partake in refreshments and meet other students. Providing snacks helps to create a welcoming atmosphere that supports informal conversation among the participants. This, paired with the varying locations, provides the necessary infrastructure for presentations, workshops, and networking, while also reinforcing the libraries' role as central hubs for learning, engagement, and community building.

In addition to the speaker events, hands-on workshops are developed to complement each speaker's disciplinary area (see Table II). These workshops feature low-stakes activities that center wellness and social connections, providing students with a space to build community with peers. We typically brainstorm several ideas for the workshops and test out activities to ensure they work with the timeframe, are within budget, and are group friendly. We have explored using a variety of pre-existing kits, including metal insect model kits, LEGOs, and do-it-yourself hobby kits. While some of the materials were either too fragile, time-consuming, or expensive, the hobby kits turned out to be the best balance for workshops. Students built tiny treehouses following a biological and agricultural engineering speaker and 3D puzzle model kits to complement a mechanical engineer's session. We developed a bridge building workshop to accompany a structural engineering speaker and led students through an activity with generative artificial intelligence (AI) while discussing the ethical considerations that such technology raises, after hearing from an electrical engineering speaker. By combining sustenance with interactive and flexible programming, the series encourages both intellectual and social engagement.

Table II
Event Topics and Speaker Information Overview

Semester	Disciplinary Focus Area	Event Speaker's Profession	Accompanying Workshop Activity
Fall 2023	Biological & Agricultural Engineering	Chief Operating Officer, Clinical Research	Building Tiny Treehouses
Spring 2024	Mechanical Engineering	Advanced Research and Development Product Engineer	3D Puzzle Model Kits
Fall 2024	Structural Engineering & Mechanics	Forensic Structural Engineer and CEO of an edtech & digital media company	Bridge Building
Spring 2025	Civil, Construction, & Environmental Engineering	Project Manager, Construction and Development	Engineering with LEGOs
Fall 2025	Electrical & Computer Engineering	Artificial Intelligence (AI) Engineer	Critical Play with Generative AI

To promote the events, program outreach has been carried out through a multitude of student organizations, at orientations with first year students and the College of Engineering, and in introductory Engineering 101/102 courses. Engineering 101/102 students are required to attend high impact experiences on campus as part of their curricular activities, and the Emerging Engineers planning team consulted with the course coordinators and instructors to feature events on the list of experiences that would meet this requirement. We also partner with the Libraries' Community Engagement department to add events to campus calendars and leverage existing connections with the Honors Program. The Honors Program at NC State requires students to attend multiple campus events during the semester to receive experiential learning credits, and students were encouraged to attend Emerging Engineers events as part of this program. We also worked with campus partners, including the Career Center and Prevention Services, to help cross-promote the series at their events.

Outcomes

The Emerging Engineers series' reach and impact has expanded notably since its inception in Fall 2023. The program has held a total of ten events, one speaker event and one workshop per semester. Across the ten events, we have engaged a total of 526 students so far, demonstrating a sustained interest for programming that bridges engineering disciplines, professional development, and community-building (see Table III for details).

Table III
Events Scheduling and Attendance Data

Semester	Speaker Event Attendance	Speaker Event Day & Start Time	Workshop Attendance	Workshop Day & Start Time
Fall 2023	32	Wednesday, 6:00pm	82	Tuesday, 6:00pm
Spring 2024	72	Tuesday, 6:00pm	72	Wednesday, 6:00pm
Fall 2024	86	Tuesday, 6:00pm	53	Tuesday, 6:00pm
Spring 2025	32	Wednesday, 6:00pm	37	Tuesday, 6:00pm
Fall 2025	47	Tuesday, 6:00pm	13	Tuesday, 1:00pm

Attendance data revealed that mid-week evening programming consistently drew the largest number of attendees, suggesting that scheduling plays a critical role in accessibility for attendees. Scheduling paired with early-stage outreach, especially at summer orientations and welcome-week activities, proved to be especially instrumental in establishing visibility with incoming students and building a strong foundation for participation throughout the year. The variance in attendance in later semesters also reflects the expanding landscape of wellness and professional development events offered on campus during the same period. As additional programs specifically geared towards engineering students have increased on campus, many of them organized and highly promoted by the College of Engineering or scheduled at overlapping times, students have a wider array of options to help them build community with their peers and contribute to their personal development. This increase in parallel offerings has created new challenges for the series in regards to scheduling and outreach as students have a more dynamic list of events to engage with.

Despite the new challenges, the feedback from students who have attended Emerging Engineers events continues to offer meaningful insights into the program's ongoing impact. Based on the feedback gathered through observations and direct student comments at the events, the students consistently demonstrated strong engagement with both the speakers and their peers. The team observed that students not only asked the speakers thoughtful questions about the speakers' academic and career journeys, but also initiated conversations with the speakers and other students that often extended beyond the structured portions of the sessions. Students frequently shared their enthusiasm for the events with the team, especially highlighting the opportunity to connect with other students across the engineering disciplines through the hands-on workshops. The team also received feedback from both students and faculty partners that consistently emphasized the benefit of incorporating a broad range of engineering perspectives, underscoring the program's role in fostering interdisciplinary awareness and professional exploration. Together, these observations and feedback point to programming that students not only participated in, but actively valued.

Conclusion

The logistical insights gained over the course of ten events of the series will continue to meaningfully inform future programming and planning for the series. For example, registration for several events exceeded the anticipated capacity of event spaces, so we have begun booking additional overflow spaces where speaker events can be livestreamed when the main event space becomes full. Another lesson gleaned from planning the events is to start planning at least one semester in advance. While early logistical planning generally supported smoother events overall, some events have reinforced the need for extra flexibility when coordinating with speakers, external partners, and other scheduled campus events as well. Over time, we have refined our approach to speaker outreach altogether. Initially, contacting multiple potential

speakers simultaneously appeared efficient. However, a sequential, individualized strategy ultimately led to clearer communication and more reliable scheduling. Faculty referrals continued to be far more effective than cold outreach via social media as well, allowing the team to tap into established professional networks. Together, these lessons and new funding acquired in Spring 2025 from the Eastman Chemical University Engagement Fund will sustain ongoing efforts to expand departmental representation and strengthen engagement across the engineering community.

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